

REMARKS

By the present Amendment, claims 1-9 are cancelled and claims 10-29 are added. This leaves claims 10-29 pending in the application, with claims 12 and 29 being independent.

Substitute Specification

The specification is revised to eliminate grammatical and idiomatic errors in the originally presented specification. The number and nature of the changes made in the specification would render it difficult to consider the case and to arrange the papers for printing or copying. Thus, the substitute specification will facilitate processing of the application. The substitute specification includes no "new matter". Pursuant to M.P.E.P. § 608.01(q), voluntarily filed, substitute specifications under these circumstances should normally be accepted. A marked-up copy of the original specification is appended hereto.

Election Requirements

Reconsideration is again requested relative to the requirement to elect between claims drawn to a process of producing cling fasteners and to claims directed to an apparatus for producing cling fasteners. Both sets of claims, now claims 1-28 and claim 29, respectively, relate to a single general inventive concept under PCT Rule 13.1 in a process and an apparatus for carrying out that process. The single inventive concept is the use of a formulation of radiation-cross linkable prepolymers and the curing of those prepolymers by radiation. As evidence that the method and apparatus claims do not relate to a single inventive concept, U.S. Patent No. 5,785,784 to Chesley is cited for forming a cling fastener having a radiation source for

curing a resin on a rotating shaping roll. However, as noted in greater detail hereinafter, the Chesley patent does not relate to the use of prepolymers as recited in each of claims 1 and 29. The prepolymer limitation, in combination with the curing by a radiation source, constitutes a general inventive concept common to both the process claims and the apparatus claims, rendering the election requirement untenable.

Review and reconsideration of the election requirement and consideration of claim 29 on its merits, is requested.

Drawings

Submitted herewith are corrected formal drawings for the above-identified application to correct the U.S. Patent and Trademark Office records as requested in the Office Action.

Rejections Under 35 U.S.C. § 112, Second Paragraph

Claims 2, 3, 5, 6 and 8 stand rejected as being indefinite, particularly as to reciting both a broad range or limitation in combination with a narrow range or limitation. In rewriting the claims, this objection is avoided.

The newly submitted claims are definite and comply with the requirements of 35 U.S.C. § 112.

Rejections Under 35 U.S.C. § 103

Claim 10 recites a process for producing cling fastener parts with a large number of interlocking members. The process comprises supplying a formulation 14 with radiation cross-

linkable prepolymers to a forming station (for example, that provided by shaping roll 11, backing roll 12 and gap 16), shaping the formulation in the forming station into a large number of interlocking members 24 with a base 21, and treating the interlocking members and base with radiation to cure the formulation thereof.

By forming the method of the present invention in this manner, particularly through the use of radiation curing of prepolymers, very high velocities of polymerization are achieved. The high velocity polymerization permits high production, particularly at about ten times faster than production using thermoplastic materials. Additionally, the use of prepolymers results in better defined properties of the resulting polymerized product. The amount of energy needed is reduced by the use of prepolymers by avoiding the need to heat thermoplastic materials to temperatures of up to 200°C. The cling fasteners made from prepolymers are more temperature and heat resistant than cling-fasteners made from conventional thermoplastic materials. Thus, the use of prepolymers results in significant advantages.

Claims 1, 2 and 4-8 stand rejected under 35 U.S.C. § 103 as being unpatentable over U.S. Patent No. 6,579,162 to Chesley. The Chesley '162 patent is cited for a method of making fasteners, in column 8, line 47, to column 9, line 33, involving supplying a radiation cross linkable molding material between two compression rolls to form a large number of interlocking means with a base and using radiation to cure or polymerize the molding material. The use of prepolymers is considered to be inherent or obvious from the Chesley '162 patent disclosure. Regarding claim 2, the Chesley '162 patent is cited for disclosing acrylic and acrylate resins in column 9, lines 10-12. Regarding claim 4, column 9, lines 5-10, are cited relative to the electron beam curing. The same portion of the Chesley '162 patent is cited relative to the UV radiation of

claim 5. The use of photoinitiators is considered obvious relative to the recitation of claim 6.

Relative to claim 7, the Chesley '162 patent is cited as inherently disclosing shaping and backing rolls.

Claim 3 stands rejected under 35 U.S.C. § 103 as being unpatentable over the Chesley '162 patent, when further considered in view of U.S. Patent No. 4,477,405 to Makhoulf. The Makhoulf patent is cited for teaching the use of a thermosetting molding material with certain reactive diluents. In support of the rejection, it is contended that it would be obvious to use the Makhoulf reactive diluents in the Chesley '162 process.

None of the claims of this application are anticipated or rendered obvious by the Chesley '162 patent, considered alone or in combination with the Makhoulf patent since the use of prepolymers is not inherent or rendered obvious by the Chesley '162 patent.

The Chesley '162 patent teaches a formulation which is highly fluid, and thus, of low viscosity. As stated in this Chesley patent, in column 8, lines 47-51:

"The flowable material is flowed into the mold cavities, and over the surface of the mold to form the base sheet. To facilitate flowage of the material, the material typically must be heated to an appropriate temperature, and then coated onto the cavities."

A similar description appears in U.S. Patent No. 5,785,784 to Chesley, cited and distinguished in the European patent application corresponding to this application. This Chesley '784 patent describes the process and apparatus in greater detail. Particularly, the Chesley '784 patent Figure 5 discloses the highly fluid formulation exiting extruder 130 onto the surface of mold 132 and then flowing into cavities 134. The formulation flows into the cavities which are then filled by the material without assistance of opposing roll 136 located below mold 132. In view of the importance of the high fluidity of the molding material used in the two Chesley patents, one of

ordinary skill in the art would not use prepolymers in the systems of the Chesley patents since the viscosity of prepolymers is too high. The use of viscous prepolymers is contrary to the disclosure of the two Chesley patents which teach the criticality of the flowability of the molten material being facile. Particularly, the viscosity of the prepolymers would not allow it to flow voluntarily or without pressure into the cavities of the shaping roll as illustrated for example in Figure 5 of the Chesley '784 patent.

In support of the rejection, it is alleged that "a person skilled in the art would have found it obvious, if not inherent, to have used a prepolymer molding material . . . to provide a flowable material with an appropriate viscosity that would not run out of the rotating mold before it is cured." However, such molten material still has to flow into the cavities. A viscous material, such as a prepolymer, will not flow into the cavity without assistance as contemplated by the two Chesley patents.

Additionally, the prevention of the molten material "not running out" from the cavities is not based on the viscosity of the material, but is based on the interface tension and capillary effects. A highly fluid material, flowing into the cavities and adhering partly on the surface of the roll in the cavities, will not flow out of the cavities during rotation of the roll since the highly fluid material adheres at the surface of the roll due to the interface tension and in the cavities due to the interface tension and capillary effects. Thus, a person having ordinary skill in this art, knowing about the interface tension and capillary effects, would not select the appropriate viscosity for the purpose of the molding material not dropping or not dropping down from the shaping roll as the shaping roll rotates.

The high viscosity of the prepolymers in the formulation prevents the formulation from flowing loosely into the cavities. Since other effects maintain the molding material in the cavity, it would not be obvious to vary the viscosity in order to maintain the molding material within the rotating mold cavities.

As conceded in the Office Action, prepolymers are not expressly taught by either of the two Chesley patents. For the reasons noted above, such prepolymers are not inherent or rendered obvious by the Chesley patents. Accordingly, claim 1 is patentably distinguishable over the cited patents.

Claims 11-28, being dependent upon claim 10, are also allowable for the above reasons. Moreover, these dependent claims recite additional features further distinguishing them over the cited patents. Specifically, the molding, casting and compressions molding of claim 11, the prepolymers being acrylic of claim 12, the acrylate prepolymers of claims 13 and 14, the reactive diluents of claims 15-19, the electron beam curing of claim 20, the UV radiation curing of claim 21, the photoinitiator of claim 22, the specific photoinitiators of claims 23 and 24, the use of the shaping roll and backing roll of claim 25, the viscosity of claims 26-27, and the shaping in the gap between a shaping roll and a backing roll of claim 28, are not anticipated or rendered obvious, particularly within the overall claim combination.

Relative to the claims reciting reactive diluents, the Makhoulouf patent is cited. However, the Makhoulouf patent relates to a closed mold process and does not relate to a process for making cling type fasteners. Rather, the Makhoulouf patent relates to coatings. In view of the substantial differences between the Chesley patents and the Makhoulouf patent, one of ordinary skill in the art would not find it obvious to combine the subject matter of the Makhoulouf patent with the Chesley

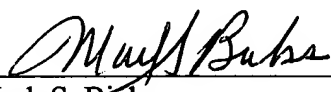
patents in the manner proposed in the Office Action. Particularly, the proposed combination is unobvious since the Makhlouf patent does not relate to a molding material encompassing prepolymers and does not relate to radiation cross-linkable molding materials. In view of these substantial differences, one of ordinary skill in the art would not find it obvious to combine the Chesley and Makhlouf patents, as proposed in the rejection.

Claim 29 relates to an apparatus for producing cling fasteners having a shaping roll with a plurality of radial cutouts, a backing roll spaced from the shaping roll to define a gap therebetween, and feeding means for supplying a formulation of radiation cross linkable prepolymers into the gap. A radiation source cures the prepolymers after being fed into the radial cutouts, with the radiation source being one of a UV radiation source and electron beam source.

In this manner, claim 29 relates to the same general invention as the subject matter of claim 10, and is patentably distinguishable over the cited patents for the same reasons discussed above. Such reasons are not repeated to avoid burdening the record.

In view of the foregoing, claims 10-29 are allowable. Prompt and favorable action is solicited.

Respectfully submitted,



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